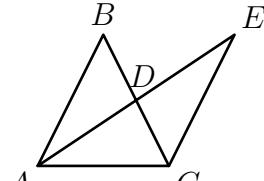


PRACTICE PROBLEMS

CROSSROADS ACADEMY
AMC PREPARATION

1. GEOMETRY

- (1) Square ABCD has area 60. What is the area of the square formed by connecting the midpoints of the sides of ABCD?
(A) 15 (B) 20 (C) 24 (D) 30 (E) 40
- (2) The letter T is formed by placing two 2×4 inch rectangles next to each other. What is the perimeter of the T, in inches?
(A) 12 (B) 16 (C) 20 (D) 22 (E) 24
- (3) Circle X has a radius of π . Circle Y has a circumference of 8π . Circle Z has an area of 9π . List the circles in order from smallest to largest radius.
(A) X, Y, Z (B) Z, X, Y (C) Y, X, Z (D) Z, Y, X (E) X, Z, Y
- (4) Bill walks $\frac{1}{2}$ mile south, then $\frac{3}{4}$ mile east, and finally $\frac{1}{2}$ mile south. How many miles is he, in a direct line, from his starting point?
(A) 1 (B) $1\frac{1}{4}$ (C) $1\frac{1}{2}$ (D) $1\frac{3}{4}$ (E) 2
- (5) In trapezoid ABCD, AD is perpendicular to DC, $AD = AB = 3$, and $DC = 6$. In addition, E is on DC, and BE is parallel to AD. Find the area of $\triangle BEC$.
(A) 3 (B) 4.5 (C) 6 (D) 9 (E) 18
- (6) A unit hexagram is composed of a regular hexagon of side length 1 and its 6 equilateral triangular extensions, as shown in the diagram. What is the ratio of the area of the extensions to the area of the original hexagon? (A) 1 : 1 (B) 6 : 5 (C) 3 : 2 (D) 2 : 1 (E) 3 : 1
- (7) Triangle ABC is an isosceles triangle with $\overline{AB} = \overline{BC}$. Point D is the midpoint of both \overline{BC} and \overline{AE} , and \overline{CE} is 11 units long. Triangle ABD is congruent to triangle ECD. What is the length of \overline{BD} ?



- (A) 4 (B) 4.5 (C) 5 (D) 5.5 (E) 6

2. COUNTING AND PROBABILITY

- (1) Initially, a spinner points west. Chenille moves it clockwise $2\frac{1}{4}$ revolutions and then counterclockwise $3\frac{3}{4}$ revolutions. In what direction does the spinner point after the two moves?
- (A) north (B) east (C) south (D) west (E) northwest
- (2) Elisa swims laps in the pool. When she first started, she completed 10 laps in 25 minutes. Now she can finish 12 laps in 24 minutes. By how many minutes has she improved her lap time?
- (A) $\frac{1}{2}$ (B) $\frac{3}{4}$ (C) 1 (D) 2 (E) 3
- (3) What is the product of $\frac{3}{2} \times \frac{4}{3} \times \frac{5}{4} \times \cdots \times \frac{2006}{2005}$?
- (A) 1 (B) 1002 (C) 1003 (D) 2005 (E) 2006
- (4) How many two-digit numbers have digits whose sum is a perfect square?
- (A) 13 (B) 16 (C) 17 (D) 18 (E) 19
- (5) Cassie leaves Escanaba at 8:30 AM heading for Marquette on her bike. She bikes at a uniform rate of 12 miles per hour. Brian leaves Marquette at 9:00 AM heading for Escanaba on his bike. He bikes at a uniform rate of 16 miles per hour. They both bike on the same 62-mile route between Escanaba and Marquette. At what time in the morning do they meet?
- (A) 10 : 00 (B) 10 : 15 (C) 10 : 30 (D) 11 : 00 (E) 11 : 30
- (6) Jeff rotates spinners P , Q and R and adds the resulting numbers. What is the probability that his sum is an odd number?
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- (A) $\frac{1}{4}$ (B) $\frac{1}{3}$ (C) $\frac{1}{2}$ (D) $\frac{2}{3}$ (E) $\frac{3}{4}$
- (7) A singles tournament had six players. Each player played every other player only once, with no ties. If Helen won 4 games, Ines won 3 games, Janet won 2 games, Kendra won 2 games and Lara won 2 games, how many games did Monica (the sixth player) win?
- (A) 0 (B) 1 (C) 2 (D) 3 (E) 4
- (8) A box contains gold coins. If the coins are equally divided among six people, four coins are left over. If the coins are equally divided among five people, three coins are left over. If the box holds the smallest number of coins that meets these two conditions, how many coins are left when equally divided among seven people?
- (A) 0 (B) 1 (C) 2 (D) 3 (E) 5